

Editorial

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Editorial by the guest editors

Special Issue: NANOSAFETY – Progress in (eco)toxicology, understanding of mechanisms of action and risk assessment towards a reliable and sustainable use of nanotechnology

The scope of this issue is to bring together the current knowledge of the impact of engineered nanomaterials (ENM) on environment and human health. Evidence based understanding of the underlying mechanisms as to how ENM may affect living organisms and their environment is crucial for a fact based debate and a reliable risk assessment both of which are necessary for the safe implementation of nanotechnology.

After more than a decade of nanosafety research for ENMs initiated by different national and international initiatives, today's understanding about the safe and sustainable implementation is still controversial and has several knowledge gaps which have not been addressed as yet. On the other hand, comprehensive reports and reviews already exist containing current knowledge which could enable regulatory processes to be implemented [1]. The current state of nanosafety research has past the first stage of investigation with more than 1200 papers published per year [2] and now a more important consolidation phase can be started. Focusing research activities towards more coherence and structure would help to reduce the current insecurity in consumers, industry and also in regulatory boards and researchers.

Schrurs and Lison [3] proposed a reasonable focus on six basic question which we highly support. Such demands are not new, for example, to conclude which physical and chemical properties (PCP) of nanomaterial were causing adverse effects. Opinion leaders claimed over years and still demand that these nanomaterials should be completely characterized prior to any experimental toxicity testing [4, 5]. However, this request was not followed, as was neatly shown by a recent comprehensive re-assessment study of more than 1000 original papers in different fields of nanosafety. The shocking outcome of this was that only a limited number of studies fulfilled minimal quality requirements [6].

The nanotoxicology field is a real interdisciplinary research area, which combines colloidal and material science, with life science and chemistry as well as pharmacological and toxicological aspects. Therefore an ongoing dialogue between contributors and stakeholders is necessary and desirable today and in future. In this perspective we as guest editors have created this special issue as an additional contribution towards a comprehensive and critical discussion accompanying the safe development and use of nanotechnology.

References

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